

1. Introduction

1.1 General description

Chromatopac CR601 is a data processor for chromatographs with a built-in thermal sensitive printer plotter, capable of plotting the chromatogram and printing the processed data on the same recording paper. This device, which incorporates BASIC programs for analysis, can, with programming, greatly extend its range of data processing capabilities.

Special accessories such as flexible disk drive, digital I/O port and interface for transmission are also available.

The connection of this device to the Shimadzu microcomputerized GC (GC-9A, GC-mini 3) or the microcomputerized LC (LC-4A) enables sending and receiving of data, thus improving its analyzer function as a host computer.

1.2 Specifications

Input

- Number of input channels: 1
- Input voltage: $-5\text{mV} \sim 1\text{V}$
- Input impedance: $10\text{M}\Omega$

Memorization of chromatogram

- Capacity of memory: 134 ~ 176K byte
- Time length: $(\text{WIDTH}/10) \times (34300 \sim 45000)$

Note: When WIDTH is less than 1 sec., the $(\text{WIDTH}/10)$ is 0.1 and the time length is about 0.95 ~ 1.2h. When WIDTH is 5 sec., the time length is 4.7 ~ 6.2h.

- Several different chromatograms can be stored provided that the total time length is less than the maximum.

Peak processing (Measurement of peak areas or peak heights)

- Peak areas, peak height, or both can be measured.
- Peak capacity*: 4000 peaks max.
- Minimum peak width to be processed: 0.2 second
- Presentation of retention time: 6 digits (~ 999.999 min.)
- Presentation of peak area: 9 digits ($\sim 999,999,999 \mu\text{V}$)
- Presentation of peak height: 7 digits ($\sim 1,999,999 \mu\text{V}$)
- Method of peak processing: Complete automation or manual selection of parameters

* Total capacity for raw peaks and identification peaks < 4000 .

- Recognition of peaks on tail: Automatic or by time band setting in a user selected number of ranges
- Rejection of unnecessary peaks: By time band setting in a user selected number of ranges
- Re-processing of data: Possible

Identification

- Either by absolute retention time method or by relative retention time method.
- Both the Time Band method and the Time Window method are available.
- Identification by combination of the Time Window method and the elution order method is possible.
- Max. peak capacity for identification*: 4000 peaks

Quantitative calculation

- Method: Area normalization method, corrected area normalization method, corrected area normalization method with scale factors, internal standard method, absolute calibration curve method (external standard method), and exponential calculation method (for processing FPD signals for sulfur compounds).
- Grouping: Successive and/or unsuccessive peaks can be grouped.
Peaks having different response factors can be grouped.
- Quantitation by the 2-point calibration curve method is possible.

Calibration run

- Calibration curve that does not pass the origin can be determined using two standard samples of different concentrations (2-point calibration curve method).
- Calibration curve can be determined from the average of several runs.
- Calibration curve can be determined by exponential calculation (e.g. for FPD).
- Retention times can be automatically corrected.
- A faulty calibration run can be cancelled.

Recording

- Chromatogram and processed data are presented on the same chart paper.
- Method of recording: Thermal printer plotter
- Chart paper: 21 cm wide (A4 size), roll paper, approx. 50 m long
- Chart speed: 0 ~ 100 mm/min.
- Pen speed: Complete tracing of the chromatogram signals, 40 characters sec.

- Span: 1 mV (Automatic attenuation by time program)

- Zero point can be set at a user defined level.

- Repetitive recording.

BASIC program language

- Number of commands: 35 in BASIC language and 27 in C-R3A BASIC language

- Variable: Numeric, string, logical numeric

- Number of special variables: 58

- Number of implementation supplied functions: 22

Other functions

- Number of files: 10 (Protected against power failure)

- Time programming.

Capacity of memory

- Chromatogram memory + user memory: 182K byte (48K byte max. for user memory)

4K byte of the user memory is battery backup protected.

Performance

- Dynamic range: 10^6 ($1\mu\text{V} \sim 1\text{V}$)

- Integration sensitivity: $0.1\mu\text{V}\cdot\text{sec}$ ($=0.1$ digit)

- Linearity: $\pm 0.1\%$ or better

- Reproducibility (for a day on a peak, 1 mV high and 20 seconds in half width) expressed in

C.V value: Peak area: $\pm 0.1\%$ or better

Peak height: $\pm 0.5\%$ or better

Installation requirements

- Power requirements: AC 100V, 115V, 127V, 220V, 240V $\pm 10\%$

50/60Hz, 20VA (35VA max.)

- Temperature: $5 \sim 40^\circ\text{C}$

- Humidity: $0 \sim 80\%$

- Dimensions: 360W \times 390D \times 150H mm

- Weight: About 7.5 kg